CLAIMS

1. A method of cancelling an unwanted first signal having a bandwidth at least a part of which overlies the bandwidth of a wanted second signal, the bandwidth of one of the first and second signals being greater than that of the other, the method comprising receiving the first and second signals, respectively frequency down converting the first and second signals to provide first and second low frequency signals, respectively digitising the first and second low frequency signals using synchronised ADCs to provide respective first and second digitised signals, the wider bandwidth signal being digitised at a higher sampling rate and the lower bandwidth signal being digitised at a lower sampling rate, frequency shifting the frequency down converted unwanted signal to a preselected position in the frequency down converted wanted signal, adjusting sampling rate of the first digitised signal to be the same as the second digitised signal and forming the difference between the second and first digitised signals to provide an output signal.

2. A method as claimed in claim 1, characterised in that local oscillator frequencies used for frequency down converting the first and second signals are selected to correspond to substantially the centre of their respective frequency bands and in that the centre frequency of unwanted signal is shifted to correspond to the centre frequency of the wanted signal.

3. A radio receiver comprising a receiving stage having a bandwidth to receive a wanted signal and an unwanted signal, a first frequency down conversion means (18 or 20) for converting the wanted signal to a first low IF signal, first ADC means (30 or 32) operating at a first sampling rate for digitising the first low IF signal, a second frequency down conversion means (20 or 18) for converting the unwanted signal to a second low IF signal having a centre frequency which may be different from that of the first low IF signal, second ADC means (32 or 30) operating at a second sampling rate for digitising the second low IF signal, the first and second sampling rates being

different with the lower rate being a sub-multiple of, and being synchronised with, the higher rate, frequency shifting means (46 or 62) for shifting the frequency down converted unwanted signal to a preselected position in the frequency down converted wanted signal, sampling rate adjusting means (46 or 66) for adjusting the sample rate of the unwanted signal to be the same as the sampling rate of the wanted signal, and differencing means (40 or 70) for obtaining the difference between the digitised signals having the same sampling rates.

4. A receiver as claimed in claim 3, characterised by demodulation means (52 or 58) coupled to an output of the second ADC means for recovering the unwanted signal, and modulation means (54 or 60) for modulating the recovered unwanted signal, the output of the modulation means being coupled to the sampling rate adjusting means (46 or 66).

5. A receiver as claimed in claim 4 or 5, characterised by the frequency shifting means (46 or 62) being adapted to shift the centre frequency of the unwanted digitised signal to substantially the centre frequency of the wanted digitised signal.

6. A receiver as claimed in claim 3, 4 or 5, characterised by automatic gain control means (48) for controlling the amplitude of at least one of the inputs to the differencing means.

7. A receiver as claimed in claim 3, characterised in that the first frequency down conversion means (20, 24) is provided for frequency down converting a wanted narrowband signal, in that the second frequency down conversion means (18, 22) is provided for frequency down converting an unwanted wideband signal, and in that the sampling rate of the second ADC means (30) is greater than the sampling rate of the first ADC means (32).

8. A receiver as claimed in claim 7, characterised in that the first and second frequency down conversion means provide complex outputs.

9. A receiver as claimed in claim 7 or 8, characterised by means (48) for equalising the relative amplitudes of the signals applied to the means for obtaining the difference.

10. A receiver as claimed in claim 7,8 or 9, characterised by a demodulator (52 or 58) coupled the one of the first and second ADC means generating an interfering signal for recovering the said signal and a modulator (54 or 60) coupled to an output of the demodulator.